

**Wage Differentials between Foreign Multinationals
and Local Plants and Worker Quality
in Malaysian Manufacturing**

Eric D. Ramstetter

ICSEAD

and

Graduate School of Economics, Kyushu University

Working Paper Series Vol. 2013-22

December 2013

The views expressed in this publication are those of the author(s) and do not necessarily reflect those of the Institute.

No part of this book may be used reproduced in any manner whatsoever without written permission except in the case of brief quotations embodied in articles and reviews. For information, please write to the Centre.

The International Centre for the Study of East Asian Development, Kitakyushu

Wage Differentials between Foreign Multinationals and Local Plants and Worker Quality in Malaysian Manufacturing

Eric D. Ramstetter
International Centre for the Study of East Asian Development
and Graduate School of Economics, Kyushu University
ramst@icsead.or.jp

December 2013

Abstract

Using industrial census data for 2000, and smaller sets of survey data for 2001-2004, this paper examines the extent of wage differentials between medium-large (20 or more workers) foreign multinational enterprises (MNEs) and local plants in Malaysia's manufacturing industries. On average, wages in sample MNEs were higher than in local plants by two-fifths or more. MNEs also hired higher shares of workers in highly paid occupations and with moderate or high education, in addition to being more capital intensive and relatively large. Results from large samples of 17 manufacturing industries combined suggest that statistically significant MNE-local differentials of 5-9 percent persisted even after accounting for differences in worker occupation, education, and sex, plant capital intensity and size, as well as the influences of yearly fluctuations, industry affiliation, and plant location on the constants estimated. When MNE-local differentials and all slopes are allowed to vary among the 17 industries, positive and significant differentials were observed in all estimates for six industries: food and beverages, chemicals, rubber, general machinery, electrical machinery, and furniture. Positive and significant differentials were also observed in most estimates for another five industries. However, the size and significance of these differentials often varied depending on the industry and sample examined, as well as the estimation technique used.

Keywords: Multinational corporations, Southeast Asia, manufacturing, wage determination

JEL categories: F23, J31, L60, O53

Acknowledgement:

This paper is one output of the research project "Multinationals, Wages, and Human Resources in Asia's Large Developing Economies", which was funded by the International Centre for the Study of East Asian Development (ICSEAD) in fiscal 2013 (ending March 2014). I thank ICSEAD for financial support and ICSEAD staff for logistic assistance. I also thank Niny Khor for detailed comments on a previous version. Responsibility for all opinions expressed and any remaining errors or omissions is the author's alone.

1. Introduction

There is now substantial evidence that foreign multinational enterprises (MNEs) tend to pay wages that exceed those of corresponding local firms or plants. There is also evidence that positive MNE-local wage differentials persist even after controlling for related differences between foreign MNEs and local firms or plants (e.g., differences in factor intensity, size, industry affiliation, and location). However, most previous studies of MNE-local wage differentials have been unable to account for the influence of corresponding labor quality differentials in MNEs and local firms or plants. Lipsey and Sjöholm's (2004a) study of Indonesian plants in 1996, which finds that MNE-local differentials persisted even after accounting for worker education, is the major exception. Moreover, aside from limited evidence in studies by Lim (1977) and Lee and Nagaraj (1995), and the descriptive statistics presented in Ramstetter (1995, 1999) and Ramstetter and Haji Ahmad (2009), there is very little evidence regarding MNE-local wage differentials for the important case of Malaysia.¹ Data constraints have been an important reason for this important gap in the literature. This paper begins to fill that gap by using plant-level data from Malaysia's manufacturing census for 2000 and related surveys for 2001-2004 that allow for examination of MNE-local wage differentials after accounting for two important aspects of labor quality, educational background and occupation.

The paper begins with a short literature review and a description of methodologies used to examine the question of whether MNEs pay higher or lower wages than their local counterparts (Section 2), before examining the data and some descriptive statistics (Section 3). Results of estimating Mincer-type equations, which reveal the extent of wage differentials after accounting for differences in labor force quality and other related plant characteristics,

¹ With the exception of Lee and Nagaraj's (1995) analysis of a limited sample of workers in the Klang Valley, which focused on male-female differentials, previous studies of Malaysia do not analyze MNE-local wage differentials.

are then analyzed (Section 4). Finally some conclusions and suggestions for future research are offered (Section 5).

2. Literature Review and Methodology

Lipsey and Sjöholm's (2004a) study of manufacturing plants in Indonesia in 1996 is perhaps the most sophisticated study of MNE-local wage differentials and their relationship to labor quality available for host, developing economies.² They estimate Mincer-type equations for white- and blue-collar workers by industry and account for the influence of worker educational background, the share of female workers, as well as other plant-level characteristics related to wages (size, energy per worker, inputs per worker). They found that MNEs paid higher wages than local plants and that statistically significant wage differentials persisted after accounting for the educational background of the plant's workforce and the other plant-level characteristics. Ramstetter and Phan (2007) also found that positive wage differentials between MNEs and local, private firms in Vietnam persisted after accounting for firm's size, factor intensity, shares of technical workers, and shares of females in the firm's workforce. In contrast, results from Lee and Nagaraj's (1995) sample of workers in the Klang Valley of Malaysia in 1991 suggest that foreign ownership of a plant had no significant effects on wages of either male or female workers, after the influences several measures of labor quality (education, experience, occupation, training) and numerous other worker- and plant-level variables were accounted for.³

Other studies of Malaysia (Lim 1977), Thailand (Movshuk and Matsuoka-Movshuk 2006, Ramstetter 2004), and Venezuela and Mexico (Aitken et al 1996) have found that MNE-local

² These authors also examine other aspects of wage differentials and how they change over time in Lipsey and Sjöholm (2004b, 2005, 2006) and Sjöholm and Lipsey (2006).

³ These variables were union membership, marital status, migration status, total hours worked, plant size, and plant export-orientation.

wage differentials tended to persist after accounting for similar plant- or firm-level characteristics, but were unable to account for the influences of labor force quality. In addition, Ismail and Haji Mat Zin (2003) and similar studies of workers in other economies usually reveal significant returns to human capital, when measured by worker education, training, and experience, for example. There is thus substantial previous evidence that both plant ownership and worker quality have important influences on worker earnings. It is clear that relatively well educated, experienced, and well-trained workers generally expect relatively high returns to their work efforts. Firms or plants hiring high-quality workers usually expect relatively high productivity from them and offer commensurate compensation.

The primary reason that MNEs pay higher wages than local plants is probably the well documented tendency for MNEs to be relatively technology- or skill-intensive compared to non-MNEs (Caves 2007; Dunning 1993; Markusen 2002). However, even relatively sophisticated studies like Lipsey and Sjöholm (2004a) probably fail to fully account for MNE-local differences in skill intensity. For example, in addition to differences in worker education, there may be important differences in worker occupation, training, background, and experience that are often accounted for in studies of wage determination among individuals. In this study of Malaysia, for example, it is possible to account for differences in education and occupation, but the available data do not contain information on worker background (e.g., race, nationality), training, or experience.

Other reasons for MNE-local differentials are perhaps less clear, but there are at least three important possibilities. First, there is substantial evidence that MNEs often find it difficult to identify and retain suitably qualified workers. For example, in 1998, securing adequate quantity and quality of labor was the third most common of 27 possible problems for Japanese affiliates operating in the ASEAN-4 (the four largest developing economies in the Association of Southeast Asian Nations: Indonesia, Malaysia, the Philippines, and Thailand),

this problem being cited by 8.5 percent of these MNEs (Japan, Ministry of Economy, Trade and Investment 2001, pp. 536-537).⁴ Other surveys also indicated that securing labor supply was the third most frequently cited of 14 investment motives of Japanese affiliates in Malaysia, being cited by 11-13 percent of these firms during 2000-2004 (Toyo Keizai, various years).⁵ Correspondingly, many of the aforementioned studies suggest that MNEs may pay relatively high wages to secure or retain labor in economies like Malaysia.

Second, workers in host economies are often relatively familiar with management practices in local firms and may therefore be relatively reluctant to work for MNEs that often use less familiar management styles. This may lead them to demand a premium for working in the relatively unfamiliar MNE environment. Unfortunately, there is relatively little empirical evidence on this point, though many of the studies reviewed above mention it. On the other hand, relatively recent surveys of Malaysian university graduates suggest that MNEs are actually among the more popular employers for educated workers in this economy.⁶

Third, MNEs are often hypothesized to have important firm-specific assets in relatively large amounts compared to non-MNEs.⁷ These firm-specific assets are generally intangible, and many of them are related worker quality. However, even when an MNE's intangible assets are not directly related to worker skills, they may facilitate higher worker productivity by improving a firm's marketing and management, for example. In other words, the MNE's

⁴ The most commonly cited problems were (1) competition for product markets (11.2 percent) and (2) political instability (8.6 percent).

⁵ The most commonly cited motives were (1) development of local markets and (2) strengthening of international competitiveness, which were cited by 21-31 percent of affiliates.

⁶ For example, seven of the top 10 employers in 2008 were foreign companies in Malaysia (<http://malaysias100.com/media/foreign-firms-the-favorite>).

⁷ Some theorists (especially Dunning) view the possession of firm-specific assets or ownership advantages as a key necessary condition for a firm to become an MNE (in addition to internalization and location advantages). Other theorists (Buckley and Casson 1992; Casson 1987; Rugman 1980, 1985) dispute this view, choosing instead to emphasize the role of internalization as the key distinguishing characteristic between MNEs compared to non-MNEs. However, the important point is that all agree that MNCs tend to possess these kinds of firm-specific assets in relatively large amounts.

possession of firm-specific assets has the potential to make workers more productive in MNEs than in non-MNEs, even if labor quality is identical in MNEs and non-MNEs. In such cases, MNEs may find it profitable to pay relatively high wages to compensate for their relatively high productivity, especially when the ability to utilize firm-specific assets is related to workers' firm-specific experience or motivation, for example.

Partially reflecting differences in firm-specific assets, MNE-local wage differentials are thought to result from differences in other plant-level characteristics that might affect labor productivity and/or wages. For example, much of the literature reviewed above suggests that firms or plants which are relatively large or capital-intensive often pay relatively high wages and have relatively high labor productivity. In addition, location and industry affiliation are found to have important influences on the wage levels in firms or plants. Plants with relatively large shares of female workers often tend to pay relatively low average wages because females generally earn less than males, and Malaysia is no exception.⁸ Thus, this paper will follow the previous literature summarized above and estimate earnings equations that account for the influences of worker quality and sex, plant size, factor intensity, location, and industry affiliation, as well as ownership (MNE vs. local owners). Particular attention will be paid to labor quality which can be measured in two ways with the data obtained. The industry dimension will also be carefully considered by the use of industry dummies in samples of all plants in 17 industries combined and by estimating separate equations for each industry (thereby allowing both intercepts and slopes to vary across industries).

3. Data and Descriptive Statistics

This study employs the micro data underlying Malaysia's census of manufacturing plant

⁸ For evidence on Malaysia, see Chapman and Harding (1985), Lee and Nagaraj (1995), Milanovic (2006), and Schafgans (2000).

activity in 2000 (Department of Statistics 2002) and smaller surveys of stratified samples for 2001-2004 (Department of Statistics various years). If samples are limited to plants with viable basic data (i.e., positive values of paid workers, output, worker compensation, and fixed assets), there were 18,799 plants in the 2000 census, but corresponding samples included only 11,898 to 13,197 plants in 2001-2004 (Appendix Table 1c). Most of the difference between the census and survey samples results from the census' inclusion of small plants with limited production or employment. For example, if samples are limited to medium-large plants with 20 or more paid workers and viable basic data (positive output, worker compensation, and fixed assets), the 2000 census contained 8,540 plants and the subsequent surveys 7,406 to 7,581 plants. These medium-large plants accounted for 95-97 of the paid workers (Table 1) and 97-98 percent of the output (Appendix Table 1b) by all plants with viable basic data.

Three types of ownership are identified in these data, majority-local plants, 50-50 joint ventures, and majority-foreign plants. MNEs are thus defined rather narrowly as plants with foreign ownership shares of 50 percent or more.⁹ MNEs are predominantly medium-large plants which differ from small, predominantly local plants in important ways.¹⁰ Thus, it is more meaningful to limit analyses of MNE-local wage differentials to medium-large plants than to include all plants. In addition to making sample size more consistent over time and allowing more meaningful MNE-local comparisons, dropping small plants has the important advantage of removing most outliers from the samples.¹¹ The analysis also excludes seven

⁹ This definition is narrower than usual because MNEs are usually defined as plants or firms with foreign ownership shares of 10 percent or more. Unfortunately, it is impossible to use the standard definition because the precise foreign ownership share is not collected.

¹⁰ Medium-large plants accounted for 90-95 percent of all MNE plants compared to only 41-60 percent of local plants (Appendix Table 1c). Medium-large plants also accounted for 99.7 percent or more of the paid workers (Table 1) and the output (Appendix Table 1b) of all MNEs, while corresponding shares for local plants were 93 percent or more.

¹¹ For example, in the entire 2000-2004 sample, there were 4,592 observations of plants paying extremely low average compensation per worker of less than RM100 (about US\$26)

relatively small industries with few MNEs, heterogeneous definitions, and/or heavy government regulation.¹²

The 17 industries included in the sample consisted of one combination of two 2-digit categories (office, computing, and precision machinery), three 3-digit categories (rubber, plastics, furniture) and 13 2-digit categories (the remaining industries in Table 1). The criteria for defining the 17 industries were (1) inclusion of competing plants in the same industry (because there are many multi-product plants in Malaysia, definitions are rather broad), (2) industry size measured in terms of paid workers or output, and (3) insuring sufficient samples of MNEs and local plants in each industry to facilitate reasonable comparisons. These 17 industries employed the vast majority of the paid workers in medium-large plants with viable basic data (89-91 percent, Table 1).

In 2001, paid employment in the 17 sample industries was 11 percent lower than in 2000, partially because coverage was lower in survey years than in the census year. However, most of the decline in 2001 probably resulted from the dot.com-related recession, which led to a sharp fall in real manufacturing GDP.¹³ Its effects on the three electronics-related industries (office, computing, and precision machinery, electrical machinery, and radio, tv, and communication machinery) were particularly large. In these three industries, paid employment declined by 101,881 workers, which was over two-thirds of the decline in all 17 industries (150,705 workers). These three industries accounted for about one-third or more of

per year. However, only 20 medium-large plants reported similarly low wages.

¹² Five of these industries (tobacco, leather and footwear, petroleum products, other transport equipment, and recycling) had only a dozen or fewer medium-large MNE plants in at least four of the five years, two were heterogeneous and relatively small industries (other transport equipment and miscellaneous manufacturing), and one industry is closely regulated by the government (printing and publishing).

¹³ In 2001, real manufacturing GDP growth was -5.9 percent if measured at 1987 prices and -4.3 percent if measured at 2000 prices (Department of Statistics 2011b). This compares to 18 percent in 2000 (1987 prices), 4.3 (1987 prices) or 4.1 (2000 prices) percent in 2002, 8.6 (1987 prices) or 9.2 (2000 prices) percent in 2003, and 9.8 (1987 prices) or 9.6 (2000 prices) percent in 2004.

all paid employment in the 17 industries (36 percent in 2000, 32-33 percent in other years) and are very important in Malaysia.

Radio, tv, and communication machinery was the largest of the 17 industries, employing 330,140 paid workers in 2000, 250,308 in 2001, and 270,046-292,317 in subsequent years (Table 1). MNEs accounted for 70-78 percent of these workers and 82-93 percent in in office, computing and precision machinery, which was another industry where maximum paid employment topped 100,000 (in 2000). Electrical machinery was a smaller employer (maximum 77,121) with relatively large MNE shares (54-62 percent). However, in other industries with large paid employment (over 100,000 in at least one year), MNE shares were much smaller, 12-14 percent in food and beverages, 14-17 percent in wood, and 23-31 percent in plastics. MNEs also played relatively large roles in several of the smaller industries examined in this study. For example, they accounted for 40 percent or more of the paid workers in at least one year in textiles, apparel, chemicals, rubber, and general machinery. In the 17 industries combined, MNEs accounted for just over two-fifths of paid employment (41-42 percent), somewhat larger shares of manufacturing employment than in most of East Asia's large developing economies (Ramstetter 2012b).

MNEs generally paid higher wages, defined as compensation per worker (including payments in kind, social insurance payments, and other items), than local plants (Table 2).¹⁴ If all 17 industries are combined, this definition of wages was an average of 41-46 percent higher in MNEs than in local plants. However, there was a large variation in wage levels and MNE-local wage differentials among industries. MNE wages were highest in chemicals in all years and increased from just over 36,000 ringgit (just under US\$1,000) in 2000-2001 to 45,241 ringgit in 2004. MNEs also paid relatively high wages in general machinery, non-

¹⁴ In sample plants, narrowly defined wages accounted for an average of 82-84 percent of total compensation, while payments in kind accounted for 5-6 percent, social insurance payments for 8 percent, and other items for the remainder.

metallic mineral products, food and beverages, and basic metals. At the other end of the scale, MNE wages were lowest in apparel, wood, and furniture, ranging from just under 14,000 ringgit to about 18,500 ringgit.

MNE-local differentials tended to be largest in the industries that MNEs paid relatively high wages, food and beverages (70-93 percent), non-metallic mineral products (57-68 percent), chemicals (40-50 percent), and general machinery (41-55 percent). On the other hand, negative differentials were only observed in office, computing, and precision machinery (2000-2001 and 2003-2004) and radio, tv, and communication machinery (2004). Wage differentials were positive but relatively small in electrical machinery and wood (4-18 percent). MNE-local wage differentials were positive in 15 of the 17 industries in all years, exceeding 10 percent in the vast majority (14-16) of sample industries and 20 percent in a majority (10-13 industries).

Not surprisingly, similarly large variation across industries is observed in several measures of labor quality, measured either in terms of worker occupation or educational achievement, though variation of worker quality is less pronounced over time. If all 17 industries are combined, the mean share of paid workers in highly paid occupations, defined as management (including proprietors), professionals, and technicians, in paid workers, was 20 percent in MNEs in 2000 and 22-23 percent thereafter (Table 3).¹⁵ These shares were 28-37 percent higher than in local plants (ratios of 1.28-1.37 in the Table). Consistent with the notion that wages are closely related to labor quality, the industry distribution of shares of highly paid workers was similar to the industry distribution of wages. For example, in MNEs, the share of workers in highly paid occupations varied from 9-10 percent in apparel, 9-11 percent in wood, and 12-17 percent in furniture to 27-32 percent in general machinery, 23-26 percent in food

¹⁵ Conversely, occupations that tended to be lowly paid were defined as clerics and related workers, elementary occupations, plant and machine operators, assemblers, and part-time workers.

and beverages, 33-36 percent in chemicals, and 26-30 percent in basic metals. MNE-local differentials for shares of highly paid workers were positive (ratios in excess of 1) in all 17 industries in 2000, 14-15 industries in 2001-2003, and 11 industries in 2004. However, these differentials were generally smaller than corresponding wage differentials. Relatively large differentials exceeding 10 percent were observed in only 8 industries in 2004 and 11-13 industries in other years.

When all 17 industries were combined, highly educated workers (those with some kind of tertiary education) accounted for 16 percent of all workers in MNEs in 2000 and this share rose to 19 percent in 2003-2004 (Table 4). Similar to shares of highly paid workers, shares of highly educated workers were highest in chemicals and general machinery (averaging 30-31 percent), followed by non-metallic mineral products, radio, tv, and communication machinery, and basic metals. These shares were often substantially higher in MNEs than in local plants. If all 17 industries are combined, these differentials were 61 percent in 2000, 83-90 percent in 2001-2003, and 71 percent in 2004. At the industry-level MNEs had higher shares in 12-15 of the 17 industries. Moreover, differentials exceeded 10 percent in 11-14 industries and 20 percent in 9-13 industries. In other words, MNEs clearly hired relatively large shares of highly educated workers compared to local plants.

MNEs also tended to hire relatively large shares of moderately educated workers (those who completed the Malaysian Education Certificate or SPM but did not continue to tertiary education, Table 5). If all 17 industries are combined, these workers accounted for just under two-fifths of all employees in MNEs, and these shares were 20-37 percent higher than in local plants. The highest MNE shares were observed in motor vehicles, radio, tv, and communication machinery, office, computing and precision machinery, paper products, and electrical machinery. In other words, MNEs were relatively large employers in the three electronics-related industries, and they also hired relatively large shares of moderately

educated workers in these industries. MNE-local differentials were again positive in most industries, 12 in 2000 and 15-16 industries in subsequent years. Differentials exceeded 10 percent in 8 industries in 2000 and 11-13 industries in subsequent years. Thus, MNEs hired relatively large shares of both moderately and highly educated workers, and MNE-local differentials were substantially larger for highly educated worker shares than for moderately educated worker shares. Conversely, Tables 4 and 5 also make it clear that MNEs hired relatively small shares of workers who did not complete the SPM and are considered relatively unskilled in Malaysia.¹⁶

Information on the race of Malaysian workers and the number of and nationality of foreign workers are two other indicators potentially related to labor quality which were collected in the 2000 and 2005 censuses (and probably in the surveys for interim years).¹⁷ Probably because this information is sensitive in Malaysia, it was not included in the data sets provided for this and related studies. The lack of information on foreign workers is probably of most consequence because the number of foreign workers in manufacturing plants rose rapidly during the period studied, from 219,633 or 14 percent of all manufacturing workers in 2000 to 366,095 or 22 percent of the total in 2005 (World Bank 2013, pp. 24, 193). Because foreign workers tend to be relatively unskilled and paid less than Malaysian nationals, MNE-local wage differentials may also be related to differences in foreign worker shares in MNEs and local plants. Many foreign workers are also known to work in the relatively labor intensive, MNE-dominated electronics-related machinery industries (Bormann et al., 2010). However, I know of no published information on the extent to which shares of foreign workers differ between medium-large MNEs and local plants. Moreover, it is important to note that

¹⁶ In all 17 industries combined, shares of workers not completing SPM were 48 percent for MNEs in 2000 and 42-44 percent thereafter, or 20-31 percent below corresponding shares in local plants.

¹⁷ I have a copy of the survey form for the 2005 census and have been told that the same form was used in 2000-2004 by Malaysian officials.

information on race, nationality, and sex of workers reflects both aspects of worker quality and the extent which a group is discriminated against in the workplace or educational institutions, for example.

In summary, these industry-level compilations suggest MNEs tended to pay relatively high wages, as well as hire relatively large portions of workers in high-paid occupations, and with moderate or high education. Previous compilations also suggest that MNEs tend to be much larger and somewhat more capital intensive than local plants during this period (Ramstetter and Haji Ahmad 2009). These differences can all explain at least part of the observed wage differentials between MNEs and local plants. It is thus of interest to examine whether wage differentials persist after accounting for these differences between MNEs and local plants.

4. Results of Estimating Earnings Equations

Using a specification similar to that in Lipsey and Sjöholm (2004a), the extent to which MNE-local wage differentials persist after accounting for the influences of plant-level capital intensity and size, as well as worker occupation, education, and sex, can be investigated by including a dummy variable identifying MNE plants in a typical earnings equation like the following:

$$LCE = a_0 + a_1(LKE) + a_2(LO) + a_3(SH) + a_4(S3) + a_5(S2) + a_6(SF) + a_7(DF) \quad (1)$$

where

LCE=log of compensation per employee in a plant (2000 ringgit)

LKE=log of fixed assets per employee in a plant (2000 ringgit)

LO=plant size, measured as the log of output in a plant (2000 ringgit)

SH=share of paid workers in highly paid occupations in a plant (percent)

S3=share of paid and unpaid workers with high education in a plant (percent)

S2=share of paid and unpaid workers with mid-level education in a plant (percent)

SF=share of paid workers that are female in a plant (percent)

DF=dummy variable identifying MNE plants (=1 if MNE, 0 otherwise)

As in Table 2, the dependent variable is defined to include all compensation to employees

including all bonuses, payments in kind, social insurance payments, and other compensation. Nominal wages are converted to real values with the consumer price index. Reflecting previous discussion, signs of the coefficients on capital intensity ($a1$) and size ($a2$) are generally expected to be positive because capital-intensive and larger plants are generally expected to have more productive and better paid workers than smaller, more labor-intensive ones. Capital intensity and output are converted to real values using GDP deflators for 24 industries, which were generally defined at the 2- or 3-digit level (Department of Statistics 2011a).¹⁸ Similarly, plants with higher quality workforces are expected to pay relatively high wages and the coefficients $a3$, $a4$, and $a5$ are thus expected to be positive. In contrast, the coefficient $a6$ is expected to be negative because females generally earn less than their male counterparts in Malaysia (and in many other countries).¹⁹ Similarly, if data were available, it would be interesting to include the share of foreign workers in this equation, but this is not possible. To these extent that there are MNE-local differences in shares of foreign workers, worker experience and training (which are not available), estimates of equation (1) may face an omitted variable problem. Finally, if MNE-local wage differentials persist after accounting for capital intensity, size, as well as worker occupation, education, and sex, $a7$ will be positive.

Plant-level panels are compiled using plant identity codes in the data and estimated equations also include sets of year, region, and industry dummies to account for year-specific, region-specific, and industry specific influences on the constant which are not captured by the plant-level variables. Year-specific dummies use the first year in each sample as the base and

¹⁸ This is reasonable for output but not very accurate for capital because changes in asset prices are not reflected. Unfortunately, I know of no deflators for fixed assets in Malaysia.

¹⁹ Alternatively, Ramstetter (2012a) disaggregates shares of workers in highly paid occupations, highly educated workers, and moderately educated workers by sex. This paper uses the specification in equation (1) because it simplifies interpretation coefficients on the occupation, education, and sex variables, and is more comparable to the specification in Lipsey and Sjöholm (2004a). Most importantly, estimates of MNE-local wage differentials from equation (1) are very similar to corresponding estimates of the alternative specification in Ramstetter (2012a).

estimates are performed for both 2000-2004 and 2001-2004. These alternative samples are used to examine the sensitivity of the results to the inclusion of the census year and to facilitate comparisons of a contemporaneous specification with a lagged specification where all independent variables are lagged one year. The lagged specification is used because it is less likely to be affected by simultaneity issues. Although simultaneity may not be a large problem in equation (1) because wage levels are not likely to be an important determinant of the right-hand side variables, the lagged specification provides an important robustness check.²⁰

Region dummies are usually defined at the state level, but the lack of observations makes it necessary to combine some states when performing industry-level estimates. In three cases, states with similar population densities and nearby locations are combined (Perlis and Kedah, Kelantan, Terengganu, and Pahang, and finally Sabah, Sarawak, and Labuan). As a result there are usually 10 regions with 9 dummies defined using Kuala Lumpur as the base.²¹ Industry dummies are defined at the 3-digit level. Because some industries are defined at the 3-digit level and other 3-digit subcategories contain too few plants to facilitate estimation, industry dummies are excluded from several of the industry-level regressions.²² Because the descriptive data and previous research for Indonesia and Thailand suggest large variation in MNE-local wage differentials among industries, estimates are performed individually for 17 industries and compared to results for the 17 industries combined. In general, the industry-level results are thought to be more reliable than results for all 17 industries combined.

²⁰ Ramstetter (2012a) also estimates an alternative, contemporaneous specification (see note above) for 2000-2002 and 2002-2004, in addition to 2000-2004. Results for the subperiods suggest that significant, MNE-local wage differentials were more common in the earlier period. This paper focuses on longer panels because they are thought to be relatively reliable and they can facilitate more meaningful estimates of the lagged specification.

²¹ In the regression for office, computing and precision machinery, one less region is used because of the lack of plants.

²² Industry dummies are not included in estimates for apparel, wood, paper, rubber, plastics, motor vehicles, and furniture (Appendix Table 6).

Results of pooled ordinary least squares (OLS) and random effects panel estimates are also compared to evaluate the robustness of the results to alternative econometric assumptions. Fixed effects panel estimates are often used with data such as these, but they cannot reveal the extent of MNE-local wage differentials because ownership is time invariant for most plants. Hence, if a fixed effects estimator is used, the coefficient on the MNE dummy a_7 measures the wage differential between plants changing ownership and those with constant ownership, not the MNE-local wage differential, which is the primary concern in this paper. The pooled OLS results are the easiest to interpret because its coefficient a_7 is approximately equal to the percentage difference in wages between MNEs and local plants. When a random effects estimator is used, the presence of individual effects complicates the interpretation of this coefficient, but it is still important to examine how sensitive the results are to alternative econometric assumptions.

Table 6 presents the slope coefficients, a goodness of fit measure (R^2), and the results of the Breusch-Pagan test for random effects for estimates in combined samples of all 17 sample industries. The Breusch-Pagan test is always highly significant at the 1 percent level or better, both in these combined estimates and in the industry-level regressions discussed below. This implies that the random effects estimates should be preferred to OLS, but I remain interested in checking the robustness of the results to alternative assumptions. In this combined sample, coefficients on capital intensity, output, and the three measures of labor quality were positive as hypothesized and highly significant in almost all estimates. The only exception was in the contemporaneous specification for 2000-2004, when the coefficient on the share of moderately educated workers became insignificant. The coefficient on the female share was negative as hypothesized and highly significant. R^2 ranged from 0.55 to 0.57, indicating that these estimates described the variation in the dependent variable reasonably well. The coefficient a_7 was positive and highly significant in all estimates, indicating that MNE-local

wage differentials among all medium-large plants remained positive and meaningful statistically, even if the influences of capital intensity and size, as well as worker occupation, education, and sex, are accounted for. Not surprisingly, however, accounting for these influences greatly reduced the size of MNE-local wage differentials from over 40 percent (Table 2) to 8-9 percent when estimated by pooled OLS and 5-7 percent when estimated by random effects.

Space constraints prevent the presentation of all slope coefficients for all 17 industry-level estimates but they are provided for reference in Appendix Table 6. The output variable was the only one that was consistently positive and significant at the 5 percent level or better in all 102 estimates performed. Positive and significant coefficients were also common for shares of highly paid and highly educated workers as well as capital intensity (91, 85, and 79 of the estimates, respectively). The coefficient on the female share was also negative and significant in most industry-level estimates (74). The equation fit the data the worst in furniture, where R^2 ranged from 0.30 to 0.38. R^2 was 0.39 or higher in all other industries. The smallest sample was 322 observations in the lagged specification for office, computing, and precision machinery, and most samples exceeded 1,000. In short, for these 17 industries, all samples are sufficiently large to allow relatively reliable analysis and the estimates explained the variation of wages relatively well.

Table 7 presents estimates of the MNE-local wage differentials from industry-level estimates of equation (1). As in Table 2, wage differentials often differ greatly across industries. These wage differentials were positive and significant at the 5 percent level or better in all estimates for six of the 17 industries: food and beverages, chemicals, rubber, general machinery, electrical machinery, and furniture. Estimated differentials tended to be largest in rubber (21-23 percent if estimated by pooled OLS and 11-15 percent if estimated by random effects). Estimated differentials were also large and significant in five of the six

estimates for motor vehicles (11-16 percent, and 13-16 percent, respectively). Consistently significant differentials were smallest in chemicals (9-10 percent and 7-9 percent, respectively) and furniture (10-11 percent and 7-11 percent respectively). Differentials were also positive and significant in four of the six estimates for another four industries, apparel, plastics, non-metallic mineral products, and radio, tv, and communication machinery. In another three industries, textiles, paper, and basic metals, OLS results suggested positive and significant differentials, while random effects results suggested no significant differentials. Finally, there were no significant differentials in two industries, wood and office, computing and precision machinery, and there was only weak evidence of positive differentials in fabricated metals. Negative and significant differentials were never observed.

The results are thus more or less consistent with the observations from the descriptive statistics analyzed in the previous section. MNEs tended to pay higher wages than local plants. However, MNEs also tended to be relatively capital intensive, large, and have relatively large shares of workers in highly paid occupations and with higher or moderate education. Thus, accounting for these influences greatly reduces the scope of conditional MNE-local wage differentials in most industries. Perhaps the most conspicuous difference is in rubber products, where conditional differentials were relatively large and statistically significant, but unconditional differentials were relatively small compared to other industries. This suggests the measures of worker occupation, education, and sex, as well as capital intensity and size were not as strongly related to MNE-local differentials in this industry as in others. In contrast, the lack of significant differentials in wood suggests that worker quality, worker sex, capital intensity, and size accounted for the vast majority of the substantial unconditional differentials observed in this industry. In office, computing, and precision machinery, differentials were similarly small and/or insignificant, whether measured conditional on worker quality and other plant characteristics or unconditionally. This probably reflects the heavy MNE

dominance of this industry and its labor intensive nature. As emphasized above, conditional and unconditional differentials were either both relatively high or low in a number of other industries. However, it is very difficult to explain the precise reasons for the inter-industry variation in the size on MNE-local differentials.

5. Conclusions

This paper has investigated the extent of wage differentials between medium-large MNEs and local plants in Malaysia in the early 21st Century. A brief literature review highlighted the important fact that MNEs have often been found to pay higher wages than non-MNEs. The main cause of these wage differentials is probably the fact that MNEs tend to hire relatively large shares of highly skilled workers, but MNEs may also be motivated to pay higher wages to facilitate recruitment, reduce turnover, and compensate for higher worker productivity that results from the MNE's possession of firm-specific, generally intangible assets related to technology, marketing, and management, for example. MNE-local wage differentials can also result from workers' reluctance to work for MNEs.

In the 17 industries examined, medium-large MNEs paid wages that were on average about two-fifths more than in corresponding local plants. Consistent with previous evidence summarized in the literature review, shares of highly educated workers were also substantially (about three-fifths to 90 percent) higher in MNEs than local plants. Shares of moderately educated workers and workers in highly paid occupations were also about one-fourth to one-third higher in MNEs. Previous evidence also indicated that MNEs tended to be more capital intensive and larger than local plants during this period. Estimates of earnings equations suggest that differences in worker quality and plant characteristics were strongly correlated with plant-level wages.

After accounting for differences in worker occupation, education, and sex, as well as the size and capital intensity of plants, and the effects of industry affiliation, plant location, and annual fluctuations on the constants estimated, estimates of MNE-local wage differentials became much smaller, an average of 5-9 percent persisted in the 17 industries combined, but these differentials were highly significant statistically. When all slopes are allowed to vary among the 17 industries (by estimating separate equations for each industry), results varied among industries and estimation method. Significant differentials were more common in the pooled OLS estimates than in the random effects estimates. There were consistently significant differentials in six industries: food and beverages, chemicals, rubber, general machinery, electrical machinery, and furniture. These two key results are also robust to alternative specifications of the occupation, education, and sex variables and observed in shorter subperiods (2000-2002 and 2002-2004; Ramstetter 2012a). There was also relatively strong evidence of positive, conditional differentials in motor vehicles, apparel, plastics, non-metallic mineral products, and radio, tv, and communication machinery, but these results are not as consistent when estimated with alternative specifications or in subperiods.

These findings are an important addition to the literature on MNE-local wage differentials in Southeast Asian developing economies, largely because the Malaysian data allow more detailed measurement of worker quality than similar data for other countries. The evidence is consistent with evidence from previous studies of Indonesia, for example, suggesting that MNEs tend pay their workers more than local plants even accounting for differences in worker quality and related plant characteristics in Southeast Asia. This in turn implies that MNEs impart important benefits on the workers that are fortunate enough to work for them.

Although these results are important, this paper leaves several related questions unanswered. For example, how do MNE takeovers of local plants (or *vice versa*) affect wage differentials? Alternatively, does MNE presence affect wage levels in local plants in

Malaysia? Although such questions are of keen interest, their answers require use of statistical techniques that are not compatible with the evaluation of average wage differentials and are left for future research. Analysis of the latter question also requires aggregation of industries and the industry-level results from this paper suggest aggregation may bias results. It is also important to reemphasize that this study fails to account for several potentially important aspects of worker quality often accounted for in similar studies of earnings by individuals. These include worker background (e.g. race or nationality), experience, and training. On the other hand, worker occupation and education are arguably the two most important aspects of worker quality. And this paper provides important evidence that MNE-local wage differentials persist in Malaysian manufacturing, even after accounting for these key measures of worker quality, as well as worker sex and the size and capital intensity of plants.

References:

- Aitken, Brian, Ann. Harrison and Robert E. Lipsey (1996) "Wages and Foreign Ownership: A Comparative study of Mexico, Venezuela, and the United States", *Journal of International Economics*, 40(3-4), 345-371.
- Bormann, Sarah, Pathma Krishnan, and Monika Neuner (2010), "Migration in a Digital Age, Migrant Workers in the Malaysian Electronics Industry, Case Studies on Jabil Circuit and Flextronics", Berlin: WEED - World Economy, Ecology and Development.
- Buckley, Peter J. and Mark Casson (1992), *The Future of the Multinational Enterprise*, 2nd Edition. London: Macmillan.
- Casson, Mark (1987), *The Firm and the Market: Studies on the Multinational and the Scope of the Firm*, Cambridge, MA: MIT Press.
- Caves, Richard E. (2007), *Multinational Enterprise and Economic Analysis*, 3rd edition, London: Cambridge University Press.
- Chapman, Bruce J. and J. Ross Harding (1985), "Sex Differences in Earnings: An Analysis of Malaysian Wage Data", *Journal of Development Studies*, 21(3), 362-376.
- Department of Statistics (2002), *Census of Manufacturing Industries 2001* [2000 data]. Putrajaya: Department of Statistics.
- Department of Statistics (2011a), *Annual National Accounts, Gross Domestic Product (GDP) 2000-2010*. Putrajaya: Department of Statistics.

- Department of Statistics (2011b), *Malaysia Economic Statistics – Time Series 2011*. Putrajaya: Department of Statistics.
- Department of Statistics (various years), *Annual Survey of Manufacturing Industries*, 2002-2005 issues [2001-2004 data], Kuala Lumpur: Department of Statistics.
- Dunning, John H. (1993), *Multinational Enterprises and the Global Economy*. Workingham, U.K.: Addison-Wesley Publishing Co.
- Ismail, Rahmah and Haji Mat Zin, Ragayah (2003), “Earnings Differentials Determinants between Skills in the Malaysian Manufacturing Sector”, *Asian Economic Journal*, 17(4), 325-340.
- Japan, Ministry of Economy, Trade and Investment (2001), *Dai 29 Kai Wagakuni Kigyō no Gaikai Jigyō Katsudō [The 29th Survey of Overseas Business Activities of Japanese Companies]* (1998 data; in Japanese), Tokyo: Ministry of Economy Trade and Industry.
- Lee, Kiong-Hock and Shyamala Nagaraj (1995), “Sex Differences in Earnings: An Analysis of Malaysian Wage Data”, *Journal of Development Studies*, 31(3), 467-480.
- Lim, David (1977), “Do Foreign Companies Pay Higher Wages than Their Local Counterparts in Malaysian Manufacturing”, *Journal of Development Economics*, 4(1), 55-66.
- Lipsey, Robert E., and Fredrik Sjöholm (2004a), “Foreign Direct Investment, Education, and Wages in Indonesian Manufacturing”, *Journal of Development Economics*, 73(1), 415-22.
- Lipsey, Robert E., and Fredrik Sjöholm (2004b), “FDI and Wage Spillovers in Indonesian Manufacturing,” *Review of World Economics*, 40(2), 321-32.
- Lipsey, Robert E. and Fredrik Sjöholm (2005), “Host Country Impacts of Inward FDI: Why Such Different Answers?” in Theodore H. Moran, Edward M. Graham, and Magnus Blomstrom, eds., *Does Foreign Direct Investment Promote Development?*, Washington D.C.: Institute for International Economics, pp. 23-43.
- Lipsey, Robert E. and Fredrik Sjöholm (2006), “Foreign Multinationals and Wages in Indonesia” in Eric D. Ramstetter and Fredrik Sjöholm, eds., *Multinationals in Indonesia and Thailand: Wages, Productivity and Exports*. Hampshire, UK: Palgrave-Macmillan, pp. 35-53.
- Markusen, James R. (2002), *Multinational Firms and the Theory of International Trade*. Cambridge, MA: M.I.T. Press.
- Milanovic, Branko (2006), “Inequality and Determinants of Earnings in Malaysia”, *Asian Economic Journal*, 20(2), 191-216.
- Movshuk, Oleksandr and Atsuko Matsuoka-Movshuk (2006), “Multinationals and Wages in Thai Manufacturing”, in Eric D. Ramstetter and Fredrik Sjöholm, eds., *Multinationals in Indonesia and Thailand: Wages, Productivity and Exports*. Hampshire, UK: Palgrave-Macmillan, pp. 54-81.
- Ramstetter, Eric D. (1995), "Characteristics of Multinational Firms in Malaysia: A Time Series Perspective" in Mitsuru Toida and Daisuke Hiratsuka, eds., *Ajia Kogyōken no Keizai Bunseki to Yosoku (IV) [Projections for Asian Industrializing Region (IV)]*, Tokyo: Institute of Developing Economies, pp. 95-171.
- Ramstetter, Eric D. (1999), “Comparisons of Foreign Multinationals and Local Firms in Asian Manufacturing Over Time”, *Asian Economic Journal*, 13(2), 163-203.

- Ramstetter, Eric D. (2004), "Labor productivity, wages, nationality, and foreign ownership shares in Thai manufacturing, 1996-2000", *Journal of Asian Economics*, 14(6), 861-884.
- Ramstetter, Eric D. (2012a), "Do Multinationals Pay High Wages in Malaysian Manufacturing?", Working Paper 2012-05, Kitakyushu: International Centre for the Study of East Asian Development.
- Ramstetter, Eric D. (2012b), "Foreign Multinationals in East Asia's Large Developing Economies", Working Paper 2012-06, Kitakyushu: International Centre for the Study of East Asian Development.
- Ramstetter, Eric D. and Phan Minh Ngoc (2007), "Employee Compensation, Ownership, and Producer Concentration in Vietnam's Manufacturing Industries", Working Paper 2007-07, Kitakyushu: International Centre for the Study of East Asian Development.
- Ramstetter, Eric D. and Shahrazat Binti Haji Ahmad (2011), "Foreign Multinationals in Malaysian Manufacturing After the Crisis", *Thammasat Economic Journal*, 29(4), 124-160.
- Rugman, Alan M., (1980) "Internalization as a General Theory of Foreign Direct Investment: A Re-Appraisal of the Literature," *Weltwirtschaftliches Archiv*, 116(2), 365-379.
- Rugman, Alan M. (1985) "Internalization is Still a General Theory of Foreign Direct Investment," *Weltwirtschaftliches Archiv*, 121(3), 570-575.
- Schafgans, Marcia M.A. (2000), "Gender Wage Differences in Malaysia", *Journal of Development Economics*, 63(2), 351-378.
- Sjöholm, Fredrik and Robert E. Lipsey (2006), "Foreign Firms and Indonesian Manufacturing Wages: An Analysis with Panel Data", *Economic Development and Cultural Change*, 55(1), 201-221.
- Toyo Keizai (various years), *Kaigai Shinshutsu Kigyō Souran: Kaisha Betsu Hen [A Comprehensive Survey of Firms Overseas: Compiled by Company]*, 2001-2005 issues. Tokyo: Toyo Keizai.
- World Bank (2013), *Immigration in Malaysia: Assessment of its Economic Effects, and a Review of the Policy and System*, Washington, D.C.: World Bank, Human Development Social Protection and Labor Unit East Asia and Pacific Region.

Table 1: Number of Paid Workers in All Plants with Viable Data and MNE Shares

Industry	Paid workers in all plants (1,000s)					MNE shares of paid workers (%)				
	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
MEDIUM-LARGE PLANTS, 20+ workers	1,498	1,341	1,441	1,452	1,501	40	41	40	40	40
17 sample industries	1,397	1,246	1,339	1,352	1,393	41	42	41	41	42
Food & beverages	113.945	113.523	120.215	123.549	124.806	14	14	13	12	13
Textiles	44.005	39.219	43.427	37.962	36.242	48	47	50	43	45
Apparel	69.244	64.769	74.281	68.214	77.000	30	35	42	34	49
Wood products	123.493	112.469	108.890	111.324	114.278	14	15	15	17	17
Paper products	32.185	29.457	32.898	30.494	34.040	16	21	17	15	16
Chemicals	45.406	42.147	47.076	48.989	51.367	38	41	41	38	39
Rubber products	72.505	67.061	66.594	69.072	72.318	36	37	39	41	39
Plastics	91.455	82.441	98.369	101.143	100.176	23	24	28	30	31
Non-metallic mineral products	55.508	55.623	55.732	54.158	54.182	22	23	24	23	24
Basic metals	39.878	37.959	40.128	40.835	42.081	24	24	25	27	22
Fabricated metals	57.730	52.093	61.743	63.662	68.045	28	26	24	27	24
General machinery	46.561	45.091	45.420	44.943	51.062	52	47	41	38	40
Office, computing & precision machinery	101.030	95.658	82.802	81.936	89.155	82	85	92	91	93
Electrical machinery	77.121	60.444	65.876	67.848	67.425	54	62	50	60	59
Radio, tv & communication machinery	330.140	250.308	279.046	292.317	285.123	70	78	74	73	73
Motor vehicles	33.700	38.999	46.739	47.776	50.597	16	12	10	15	16
Furniture	63.286	59.226	69.289	67.987	75.369	20	18	17	14	14
7 excluded industries	101	94	103	100	107	20	21	19	16	21
SMALL PLANTS, 1-19 workers	73	48	45	43	39	2	2	2	2	2

Note: Plants with viable data are those with positive paid workers, output, worker compensation, and fixed assets; excluded industries are tobacco, leather & footwear, publishing, petroleum products, other transport equipment, miscellaneous manufacturing, and recycling.

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Table 2: Mean Annual Compensation per Paid Worker in Medium-Large MNEs and MNE-Local Differentials

Industry	MNEs (current ringgit/year)					MNE-local ratios				
	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
17 sample industries combined	23,205	25,128	25,987	27,092	27,910	1.407	1.464	1.451	1.440	1.432
Food & beverages	28,428	28,909	31,257	31,585	32,886	1.702	1.835	1.931	1.852	1.878
Textiles	19,341	20,210	20,166	20,366	19,744	1.307	1.263	1.239	1.218	1.118
Apparel	13,986	15,085	14,508	14,969	16,142	1.222	1.279	1.193	1.210	1.380
Wood products	15,390	15,853	15,986	15,274	16,006	1.177	1.150	1.120	1.035	1.037
Paper products	21,329	23,240	23,357	26,591	24,786	1.184	1.213	1.148	1.284	1.203
Chemicals	36,959	36,524	40,813	43,183	45,241	1.473	1.401	1.463	1.469	1.502
Rubber products	19,973	20,996	21,374	21,891	23,556	1.302	1.320	1.276	1.289	1.321
Plastics	19,187	21,252	22,820	23,429	23,020	1.217	1.272	1.307	1.290	1.157
Non-metallic mineral products	28,669	30,594	29,863	34,416	34,133	1.614	1.675	1.570	1.673	1.589
Basic metals	27,426	30,284	29,044	32,200	30,599	1.285	1.298	1.218	1.337	1.196
Fabricated metals	24,148	24,538	24,138	25,411	26,015	1.398	1.330	1.297	1.288	1.269
General machinery	29,093	32,604	34,257	37,092	36,321	1.409	1.417	1.435	1.552	1.467
Office, computing & precision machinery	22,177	22,823	25,037	24,159	25,862	0.990	0.866	1.005	0.819	0.928
Electrical machinery	19,207	21,746	21,907	22,944	23,312	1.117	1.169	1.073	1.094	1.041
Radio, tv & communication machinery	21,109	24,046	22,766	23,790	24,426	1.145	1.261	1.205	1.111	0.992
Motor vehicles	25,510	23,890	26,642	29,720	28,633	1.424	1.204	1.281	1.397	1.271
Furniture	15,141	16,507	16,839	18,530	18,455	1.188	1.263	1.180	1.307	1.247

Note: See Table 1 for a precise definition of sample plants.

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Table 3: Mean Shares of Paid Workers with Highly Paid Occupations in Sample MNEs and MNE-Local Differentials

Industry	MNEs (% of paid workers)					MNE-local ratios				
	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
17 sample industries combined	20	22	22	23	22	1.369	1.338	1.282	1.360	1.276
Food & beverages	23	25	26	25	24	1.456	1.513	1.474	1.504	1.436
Textiles	17	19	19	19	16	1.150	1.205	1.061	1.128	0.978
Apparel	9	9	10	9	9	1.104	0.904	0.969	0.886	0.555
Wood products	11	10	11	9	10	1.022	0.949	0.908	0.856	0.932
Paper products	19	20	22	24	21	1.212	1.250	1.262	1.365	1.244
Chemicals	33	33	35	36	34	1.378	1.272	1.281	1.277	1.270
Rubber products	15	16	16	15	16	1.129	1.107	1.115	1.114	1.117
Plastics	19	22	20	20	18	1.286	1.234	1.137	1.221	1.036
Non-metallic mineral products	22	22	21	26	24	1.468	1.333	1.185	1.567	1.410
Basic metals	26	25	27	30	26	1.407	1.185	1.228	1.395	1.317
Fabricated metals	20	20	21	22	20	1.286	1.129	1.106	1.183	1.045
General machinery	27	29	30	32	31	1.401	1.505	1.295	1.450	1.329
Office, computing & precision machinery	20	20	22	24	24	1.084	0.905	1.129	1.034	0.946
Electrical machinery	18	20	21	20	20	1.083	1.087	1.063	0.983	0.952
Radio, tv & communication machinery	20	23	23	22	23	1.239	1.150	1.028	1.019	0.962
Motor vehicles	20	20	22	24	22	1.177	1.067	1.107	1.321	1.198
Furniture	12	12	13	17	13	1.080	1.096	1.111	1.353	1.028

Note: See Table 1 for a precise definition of sample plants; highly paid occupations are (1) proprietors, business partners, (2) managers, professionals, executives, and (3) technicians, professionals.

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Table 4: Mean Shares of All (paid & unpaid) Workers with High Education in Sample MNEs and MNE-Local Differentials

Industry	MNEs (% of all workers)					MNE-local ratios				
	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
17 sample industries combined	16	17	18	19	19	1.611	1.879	1.901	1.828	1.706
Food & beverages	17	17	19	19	19	2.113	2.435	2.658	2.563	2.370
Textiles	9	8	8	10	9	0.933	0.928	0.824	0.914	0.889
Apparel	5	5	5	5	4	1.068	1.271	1.030	0.956	0.629
Wood products	7	7	7	6	6	1.426	1.488	1.488	1.201	1.143
Paper products	16	15	17	18	16	1.312	1.424	1.442	1.368	1.225
Chemicals	28	29	31	32	34	1.517	1.677	1.626	1.582	1.557
Rubber products	11	10	9	10	10	1.200	1.283	1.129	1.074	1.139
Plastics	14	16	18	17	15	1.292	1.593	1.625	1.545	1.209
Non-metallic mineral products	19	19	19	25	21	2.000	2.288	2.203	2.797	2.029
Basic metals	18	17	18	20	18	1.268	1.337	1.426	1.464	1.269
Fabricated metals	16	16	17	18	18	1.258	1.578	1.762	1.694	1.643
General machinery	26	28	31	35	31	1.996	2.207	2.086	2.448	1.930
Office, computing & precision machinery	16	15	16	19	21	0.975	0.712	0.820	0.695	0.731
Electrical machinery	14	17	18	17	17	0.973	1.288	1.233	0.972	0.969
Radio, tv & communication machinery	16	19	18	18	20	1.048	1.234	1.026	0.983	0.953
Motor vehicles	15	14	19	20	18	1.182	1.124	1.340	1.548	1.375
Furniture	7	6	6	9	8	0.986	0.911	1.236	1.379	1.152

Note: See Table 1 for a precise definition of sample plants; high education is defined as education beyond the Malaysian Education Certificate (SPM), an exam taken by all students in the 5th year of secondary school (i.e., some level of vocational school, college, university, or graduate school).

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Table 5: Mean Shares of All (paid & unpaid) Workers with Mid-level Education in Sample MNEs and MNE-Local Differentials

Industry	MNEs (% of paid & unpaid workers)					MNE-local ratios				
	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
17 sample industries combined	36	39	39	39	39	1.201	1.369	1.355	1.341	1.283
Food & beverages	35	37	35	34	38	1.295	1.372	1.344	1.236	1.328
Textiles	32	34	40	36	38	1.075	1.013	1.219	1.134	1.137
Apparel	16	22	20	20	24	0.781	1.066	1.012	0.884	0.816
Wood products	17	22	21	22	21	0.921	1.180	1.083	1.162	1.100
Paper products	39	41	44	45	43	1.109	1.250	1.290	1.282	1.179
Chemicals	41	41	42	42	40	1.104	1.161	1.131	1.074	1.033
Rubber products	28	32	34	31	35	1.049	1.178	1.309	1.203	1.282
Plastics	35	42	41	40	38	1.024	1.316	1.337	1.332	1.181
Non-metallic mineral products	33	35	34	34	34	1.275	1.392	1.425	1.416	1.412
Basic metals	38	45	46	39	37	1.127	1.344	1.336	1.230	1.160
Fabricated metals	39	41	40	38	38	1.111	1.378	1.394	1.275	1.277
General machinery	39	41	40	40	40	1.104	1.085	1.098	1.088	1.044
Office, computing & precision machinery	44	43	42	48	47	0.937	0.948	0.864	1.205	1.219
Electrical machinery	34	43	41	45	45	0.794	1.101	1.042	1.116	1.101
Radio, tv & communication machinery	43	48	46	49	48	1.007	1.294	1.119	1.146	1.064
Motor vehicles	47	51	48	49	47	1.217	1.360	1.231	1.249	1.185
Furniture	20	24	20	24	21	0.711	1.015	0.877	0.992	0.809

Note: See Table 1 for a precise definition of sample plants; mid-level education is defined as successful completion of the Malaysian Education Certificate (SPM), an exam taken by all students in the 5th year of secondary school, but no further education..

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Table 6: Multinational-Local Wage Differentials, Other Slope Coefficients, and Equation Indicators from Estimates of Equation (1) for all 17 Sample Industries Combined

Slope coefficient variable, indicator	Pooled OLS			Random Effects		
	Lagged	Contemporaneous		Lagged	Contemporaneous	
	2001-2004	2001-2004	2000-2004	2001-2004	2001-2004	2000-2004
<i>LKE</i> =capital intensity	0.0242 a	0.0329 a	0.0338 a	0.0183 a	0.0360 a	0.0367 a
<i>LO</i> =output scale	0.1071 a	0.1178 a	0.1187 a	0.1032 a	0.1229 a	0.1264 a
<i>SH</i> =highly paid share of paid workers	0.0074 a	0.0070 a	0.0082 a	0.0037 a	0.0061 a	0.0074 a
<i>S3</i> =highly educated share of all workers	0.0064 a	0.0072 a	0.0060 a	0.0042 a	0.0064 a	0.0049 a
<i>S2</i> =moderately educated share of all workers	0.0011 a	0.0011 a	0.0005 a	0.0006 a	0.0007 a	0.0001
<i>SF</i> =female share of paid workers	-0.0039 a	-0.0035 a	-0.0036 a	-0.0032 a	-0.0026 a	-0.0025 a
<i>DF</i> = MNE-local differential (ratio less 1)	0.0890 a	0.0809 a	0.0913 a	0.0749 a	0.0525 a	0.0658 a
R ²	0.5591	0.5735	0.5638	0.5454	0.5683	0.5579
Observations	21,671	26,855	34,491	21,671	26,855	34,491
Breusch-Pagan Test	-	-	-	8,254 a	10,202 a	14,135 a

Notes: a=significant at the 1% level, b=significant at the 5% level, c=significant at the 10% level; robust standard errors (clustered by plant for random effects) are used to account for potential heteroskedasticity; results of the Breusch-Pagan Test indicate the null of no random effects is always rejected at the 1% level; these results come from estimates that also include year, industry, and region dummies; full results including constants and coefficients on year, industry, and region dummies are available from the author.

Table 7: Industry-level Estimates of Multinational-Local Wage Differentials after Controlling for Capital Intensity, Size, Labor Occupation, Labor Skill, and Labor Gender from Equation (1)

Industry	Pooled OLS			Random Effects		
	Lagged	Contemporaneous		Lagged	Contemporaneous	
	2001-2004	2001-2004	2000-2004	2001-2004	2001-2004	2000-2004
Food & beverages	0.1069 a	0.1154 a	0.1176 a	0.1104 a	0.1241 a	0.1075 a
Textiles	0.1084 a	0.1155 a	0.1196 a	0.0269	0.0804 c	0.0627
Apparel	0.0764 a	0.0433	0.0499 b	0.0922 b	0.0551	0.1138 a
Wood products	0.0040	-0.0084	0.0047	0.0203	-0.0170	0.0047
Paper products	0.0805 b	0.0661 b	0.0710 a	0.0715	0.0496	0.0206
Chemicals	0.0950 a	0.0858 a	0.0958 a	0.0679 b	0.0858 a	0.0906 a
Rubber products	0.2259 a	0.2076 a	0.2195 a	0.1470 a	0.1121 a	0.1215 a
Plastics	0.0798 a	0.0749 a	0.0906 a	0.0579 b	0.0266	0.0409 c
Non-metallic mineral products	0.1077 a	0.0728 b	0.0845 a	0.0865 b	0.0142	0.0317
Basic metals	0.1023 a	0.1153 a	0.1124 a	0.0436	0.0477	0.0462
Fabricated metals	0.0408 c	0.0316	0.0692 a	0.0597 c	0.0336	0.0743 b
General machinery	0.0911 b	0.0762 b	0.0755 a	0.1141 b	0.1282 a	0.1365 a
Office, computing & precision machinery	-0.0140	-0.0503	-0.0273	0.0047	-0.0234	-0.0379
Electrical machinery	0.1020 a	0.0903 a	0.1126 a	0.0604 b	0.0789 b	0.0862 a
Radio, tv & communication machinery	0.0754 a	0.0633 a	0.0460 a	0.0719 a	0.0435 c	0.0284
Motor vehicles	0.1091 b	0.1361 a	0.1617 a	0.1267 b	0.1270 c	0.1605 b
Furniture	0.0993 a	0.1057 a	0.1090 a	0.1103 a	0.0690 b	0.0702 b

Notes: a=significant at the 1% level, b=significant at the 5% level, c=significant at the 10% level; robust standard errors (clustered by plant for random effects) are used to account for potential heteroskedasticity; results of the Breusch-Pagan Test indicate the null of no random effects is always rejected at the 1% level; other slope coefficients and equation statistics are presented in Appendix Table 6; these results come from estimates of equation (1) that also include year, industry, and region dummies; full results including constants and coefficients on year, industry, and region dummies are available from the author.

Appendix Table 1a: Number of Paid Workers in Plants with Viable Data (thousands)

Industry	Majority-local plants					MNE plants				
	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
MEDIUM-LARGE PLANTS, 20+ workers	898.91	793.84	870.09	878.36	893.48	598.95	546.93	571.08	573.79	607.04
17 sample industries	818.14	719.24	786.97	794.49	808.74	579.05	527.25	551.56	557.72	584.52
Food & beverages	98.50	97.39	104.94	109.24	108.92	15.44	16.13	15.28	14.31	15.88
Textiles	22.67	20.87	21.60	21.48	19.91	21.33	18.35	21.83	16.48	16.33
Apparel	48.43	41.83	42.76	44.71	39.27	20.82	22.94	31.52	23.50	37.73
Wood products	105.68	96.05	92.12	92.59	94.37	17.81	16.42	16.77	18.73	19.91
Paper products	26.90	23.19	27.45	25.91	28.53	5.28	6.26	5.45	4.59	5.51
Chemicals	28.28	24.66	27.79	30.28	31.25	17.13	17.49	19.29	18.71	20.11
Rubber products	46.70	42.46	40.34	40.99	43.83	25.81	24.60	26.25	28.08	28.48
Plastics	70.15	63.04	70.92	70.61	69.00	21.31	19.40	27.44	30.54	31.18
Non-metallic mineral products	43.22	42.89	42.36	41.70	41.15	12.29	12.74	13.37	12.46	13.03
Basic metals	30.38	28.92	29.98	29.91	32.83	9.50	9.04	10.15	10.92	9.25
Fabricated metals	41.60	38.59	46.77	46.66	51.87	16.13	13.50	14.98	17.00	16.17
General machinery	22.21	23.87	26.57	27.95	30.43	24.35	21.22	18.85	16.99	20.63
Office, computing & precision machinery	18.40	14.25	6.97	7.01	5.87	82.63	81.41	75.83	74.93	83.28
Electrical machinery	35.46	23.13	32.87	27.35	27.51	41.66	37.31	33.00	40.50	39.91
Radio, tv & communication machinery	100.48	55.42	73.85	78.99	76.91	229.66	194.89	205.20	213.33	208.21
Motor vehicles	28.31	34.32	41.83	40.81	42.52	5.39	4.68	4.91	6.97	8.08
Furniture	50.78	48.36	57.85	58.30	64.56	12.51	10.87	11.44	9.68	10.81
7 excluded industries	80.77	74.60	83.12	83.87	84.74	19.90	19.68	19.52	16.07	22.52
SMALL PLANTS, 1-19 workers	71.08	46.86	43.93	41.87	37.69	1.74	1.04	0.96	0.98	0.82

Note: Plants with viable data are those with positive paid workers, output, worker compensation, and fixed assets; excluded industries are tobacco, leather & footwear, publishing, petroleum products, other transport equipment, miscellaneous manufacturing, and recycling.

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Appendix Table 1b: Gross Output in Plants with Viable Data (billions of ringgit)

Industry	Majority-local plants					MNE plants				
	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
MEDIUM-LARGE PLANTS, 20+ workers	207.859	185.217	222.032	257.045	304.572	222.810	205.290	230.050	252.284	291.543
17 sample industries	176.826	157.048	189.767	213.088	249.343	210.181	188.626	206.719	239.082	273.392
Food & beverages	36.428	35.045	47.210	58.006	59.866	10.434	9.885	11.327	12.391	14.350
Textiles	2.725	2.443	2.684	2.443	2.432	4.953	4.149	3.822	3.570	3.961
Apparel	3.420	2.727	2.928	3.184	3.027	1.602	1.663	2.041	1.753	2.713
Wood products	11.047	9.473	9.759	10.836	12.108	2.000	1.797	1.897	2.018	2.678
Paper products	5.498	4.442	5.456	5.182	6.124	1.055	1.404	1.264	1.053	1.441
Chemicals	12.278	10.356	13.494	17.849	22.799	14.396	13.070	16.898	21.522	33.082
Rubber products	7.169	6.729	7.096	8.206	9.721	3.759	3.591	3.847	4.953	5.679
Plastics	8.303	7.261	9.128	9.799	10.092	3.071	2.976	6.837	7.368	6.422
Non-metallic mineral products	8.462	8.567	9.006	8.879	10.494	3.469	3.285	3.597	3.925	4.271
Basic metals	11.355	10.612	12.825	15.380	24.144	4.151	3.399	4.026	5.722	4.533
Fabricated metals	7.286	6.237	7.945	8.670	10.552	4.150	3.215	3.537	4.631	5.107
General machinery	3.489	4.568	6.221	5.276	6.256	7.604	7.238	6.430	5.870	8.103
Office, computing & precision machinery	5.714	4.105	1.738	10.112	6.522	39.155	39.569	46.808	53.192	60.259
Electrical machinery	6.812	3.698	5.465	4.830	6.429	7.578	5.740	6.789	7.816	8.306
Radio, tv & communication machinery	28.982	20.117	21.465	22.687	28.122	100.187	85.338	85.236	98.685	107.106
Motor vehicles	12.942	16.061	21.417	15.664	23.383	1.094	0.881	0.979	3.374	3.787
Furniture	4.916	4.608	5.931	6.084	7.272	1.523	1.427	1.384	1.238	1.595
7 excluded industries	31.033	28.169	32.266	43.958	55.229	12.629	16.664	23.331	13.202	18.151
SMALL PLANTS, 1-19 workers	11.891	8.370	8.294	9.462	10.282	0.447	0.243	0.211	0.307	0.210

Note: Plants with viable data are those with positive paid workers, output, worker compensation, and fixed assets; excluded industries are tobacco, leather & footwear, publishing, petroleum products, other transport equipment, miscellaneous manufacturing, and recycling.

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Appendix Table 1c: Number of Plants with Viable Data

Industry	Majority-local plants					MNE plants				
	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
MEDIUM-LARGE PLANTS, 20+ workers	7,010	6,032	6,172	6,165	6,249	1,530	1,374	1,398	1,379	1,332
17 sample industries	6,204	5,317	5,461	5,455	5,511	1,432	1,280	1,308	1,289	1,234
Food & beverages	1,126	1,105	1,137	1,086	1,094	93	91	96	90	89
Textiles	173	147	148	151	145	42	40	37	34	33
Apparel	313	266	214	220	255	48	41	38	40	36
Wood products	724	602	597	583	547	54	46	46	43	44
Paper products	231	181	185	196	213	37	36	40	37	39
Chemicals	280	234	228	259	276	128	123	137	133	134
Rubber products	287	205	211	207	215	98	89	81	76	76
Plastics	599	460	488	489	484	116	109	111	119	115
Non-metallic mineral products	413	381	370	359	362	50	52	53	51	53
Basic metals	232	212	215	211	240	56	51	52	51	48
Fabricated metals	526	505	555	544	577	115	102	97	111	100
General machinery	282	260	275	315	297	87	82	79	64	77
Office, computing & precision machinery	37	33	30	31	24	79	64	67	66	61
Electrical machinery	223	170	178	179	177	123	98	107	106	97
Radio, tv & communication machinery	193	96	124	118	83	227	188	200	201	164
Motor vehicles	133	117	135	134	127	19	17	18	21	21
Furniture	432	343	371	373	395	60	51	49	46	47
7 excluded industries	806	715	711	710	738	98	94	90	90	98
SMALL PLANTS, 1-19 workers	10,093	5,702	5,168	5,203	4,246	166	89	82	81	71

Note: Plants with viable data are those with positive paid workers, output, worker compensation, and fixed assets; excluded industries are tobacco, leather & footwear, publishing, petroleum products, other transport equipment, miscellaneous manufacturing, and recycling.

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Appendix Table 2: Mean Annual Compensation per Paid Worker in Medium-Large Plants with Viable Data (current ringgit per year)

Industry	Majority-local plants					MNE plants				
	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
17 sample industries combined	16,491	17,160	17,914	18,816	19,496	23,205	25,128	25,987	27,092	27,910
Food & beverages	16,703	15,757	16,186	17,058	17,510	28,428	28,909	31,257	31,585	32,886
Textiles	14,793	16,001	16,278	16,724	17,660	19,341	20,210	20,166	20,366	19,744
Apparel	11,444	11,798	12,164	12,372	11,698	13,986	15,085	14,508	14,969	16,142
Wood products	13,081	13,782	14,275	14,757	15,430	15,390	15,853	15,986	15,274	16,006
Paper products	18,012	19,164	20,354	20,711	20,600	21,329	23,240	23,357	26,591	24,786
Chemicals	25,093	26,075	27,895	29,391	30,127	36,959	36,524	40,813	43,183	45,241
Rubber products	15,343	15,907	16,746	16,980	17,827	19,973	20,996	21,374	21,891	23,556
Plastics	15,768	16,710	17,465	18,163	19,888	19,187	21,252	22,820	23,429	23,020
Non-metallic mineral products	17,758	18,265	19,024	20,571	21,474	28,669	30,594	29,863	34,416	34,133
Basic metals	21,349	23,326	23,855	24,082	25,582	27,426	30,284	29,044	32,200	30,599
Fabricated metals	17,277	18,451	18,606	19,728	20,502	24,148	24,538	24,138	25,411	26,015
General machinery	20,644	23,007	23,870	23,907	24,763	29,093	32,604	34,257	37,092	36,321
Office, computing & precision machinery	22,398	26,349	24,910	29,496	27,876	22,177	22,823	25,037	24,159	25,862
Electrical machinery	17,193	18,597	20,410	20,972	22,387	19,207	21,746	21,907	22,944	23,312
Radio, tv & communication machinery	18,436	19,068	18,896	21,416	24,630	21,109	24,046	22,766	23,790	24,426
Motor vehicles	17,918	19,844	20,805	21,276	22,534	25,510	23,890	26,642	29,720	28,633
Furniture	12,750	13,071	14,266	14,179	14,797	15,141	16,507	16,839	18,530	18,455
7 excluded industries combined	15,925	16,671	17,672	19,008	19,035	23,120	27,159	27,629	27,935	29,148

Note: Plants with viable data are those with positive paid workers, output, worker compensation, and fixed assets; excluded industries are tobacco, leather & footwear, publishing, petroleum products, other transport equipment, miscellaneous manufacturing, and recycling.

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Appendix Table 3: Mean Shares of Paid Workers in Highly Paid Occupations in Medium-Large Plants with Viable Data (%)

Industry	Majority-local plants					MNE plants				
	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
17 sample industries combined	15	16	17	17	17	20	22	22	23	22
Food & beverages	16	16	18	16	17	23	25	26	25	24
Textiles	15	16	17	17	17	17	19	19	19	16
Apparel	8	10	11	10	16	9	9	10	9	9
Wood products	10	11	12	11	11	11	10	11	9	10
Paper products	15	16	17	17	17	19	20	22	24	21
Chemicals	24	26	27	28	27	33	33	35	36	34
Rubber products	13	14	15	14	14	15	16	16	15	16
Plastics	15	17	18	17	18	19	22	20	20	18
Non-metallic mineral products	15	16	18	16	17	22	22	21	26	24
Basic metals	18	21	22	21	20	26	25	27	30	26
Fabricated metals	16	18	19	19	19	20	20	21	22	20
General machinery	19	20	23	22	23	27	29	30	32	31
Office, computing & precision machinery	18	23	20	23	26	20	20	22	24	24
Electrical machinery	16	19	20	21	21	18	20	21	20	20
Radio, tv & communication machinery	16	20	22	22	23	20	23	23	22	23
Motor vehicles	17	19	20	18	18	20	20	22	24	22
Furniture	11	11	12	12	13	12	12	13	17	13
7 excluded industries combined	14	16	17	16	16	18	21	21	21	20

Note: Plants with viable data are those with positive paid workers, output, worker compensation, and fixed assets; excluded industries are tobacco, leather & footwear, publishing, petroleum products, other transport equipment, miscellaneous manufacturing, and recycling; highly paid occupations are (1) proprietors, business partners, (2) managers, professionals, executives, and (3) technicians, professionals.

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Appendix Table 4: Mean Shares of Paid and Unpaid Workers with High Education in Medium-Large Plants with Viable Data (%)

Industry	Majority-local plants					MNE plants				
	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
17 sample industries combined	10	9	9	10	11	16	17	18	19	19
Food & beverages	8	7	7	7	8	17	17	19	19	19
Textiles	9	8	10	11	10	9	8	8	10	9
Apparel	5	4	5	5	6	5	5	5	5	4
Wood products	5	4	5	5	5	7	7	7	6	6
Paper products	12	11	12	13	13	16	15	17	18	16
Chemicals	19	17	19	20	22	28	29	31	32	34
Rubber products	9	8	8	10	9	11	10	9	10	10
Plastics	11	10	11	11	13	14	16	18	17	15
Non-metallic mineral products	9	8	9	9	10	19	19	19	25	21
Basic metals	14	13	13	14	15	18	17	18	20	18
Fabricated metals	12	10	10	11	11	16	16	17	18	18
General machinery	13	13	15	14	16	26	28	31	35	31
Office, computing & precision machinery	16	21	20	27	29	16	15	16	19	21
Electrical machinery	14	13	14	17	18	14	17	18	17	17
Radio, tv & communication machinery	16	15	18	19	21	16	19	18	18	20
Motor vehicles	13	12	14	13	13	15	14	19	20	18
Furniture	7	6	5	6	7	7	6	6	9	8
7 excluded industries combined	10	10	10	11	12	16	16	17	17	17

Note: Plants with viable data are those with positive paid workers, output, worker compensation, and fixed assets; excluded industries are tobacco, leather & footwear, publishing, petroleum products, other transport equipment, miscellaneous manufacturing, and recycling; high education is defined as education beyond the Malaysian Education Certificate Education (SPM), an exam taken by all students in the 5th year of secondary school (i.e., some level of vocational school, college, university, or graduate school).

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Appendix Table 5: Mean Shares of Paid and Unpaid Workers with Mid-level Education in Medium-Large Plants with Viable Data (%)

Industry	Majority-local plants					MNE plants				
	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
17 sample industries combined	30	29	29	29	30	36	39	39	39	39
Food & beverages	27	27	26	27	28	35	37	35	34	38
Textiles	30	34	33	32	34	32	34	40	36	38
Apparel	21	21	19	23	29	16	22	20	20	24
Wood products	19	19	19	19	19	17	22	21	22	21
Paper products	35	33	34	35	36	39	41	44	45	43
Chemicals	37	35	37	39	39	41	41	42	42	40
Rubber products	26	28	26	26	27	28	32	34	31	35
Plastics	34	32	31	30	32	35	42	41	40	38
Non-metallic mineral products	26	25	24	24	24	33	35	34	34	34
Basic metals	34	33	34	32	32	38	45	46	39	37
Fabricated metals	35	30	29	30	30	39	41	40	38	38
General machinery	36	38	37	37	38	39	41	40	40	40
Office, computing & precision machinery	47	45	49	40	38	44	43	42	48	47
Electrical machinery	42	39	39	41	41	34	43	41	45	45
Radio, tv & communication machinery	43	37	41	43	45	43	48	46	49	48
Motor vehicles	38	37	39	39	39	47	51	48	49	47
Furniture	28	24	22	25	26	20	24	20	24	21
7 excluded industries combined	29	29	30	31	32	38	38	38	37	39

Note: Plants with viable data are those with positive paid workers, output, worker compensation, and fixed assets; excluded industries are tobacco, leather & footwear, publishing, petroleum products, other transport equipment, miscellaneous manufacturing, and recycling; mid-level education is defined as successful completion of the Malaysian Education Certificate Education (SPM), an exam taken by all students in the 5th year of secondary school, but no further education..

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Appendix Table 6: MNE-Local Wage Differentials and Other Details from Estimates of Equation (1)

Industry, independent variable, indicator	Pooled OLS						Random Effects					
	Lagged		Contemporaneous				Lagged		Contemporaneous			
	2001-2004		2001-2004		2000-2004		2001-2004		2001-2004		2000-2004	
	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value
17 SAMPLE INDUSTRIES COMBINED (36 industry dummies, 9 region dummies)												
<i>LKE</i>	0.0242	0.00	0.0329	0.00	0.0338	0.00	0.0183	0.00	0.0360	0.00	0.0367	0.00
<i>LO</i>	0.1071	0.00	0.1178	0.00	0.1187	0.00	0.1032	0.00	0.1229	0.00	0.1264	0.00
<i>SH</i>	0.0074	0.00	0.0070	0.00	0.0082	0.00	0.0037	0.00	0.0061	0.00	0.0074	0.00
<i>S3</i>	0.0064	0.00	0.0072	0.00	0.0060	0.00	0.0042	0.00	0.0064	0.00	0.0049	0.00
<i>S2</i>	0.0011	0.00	0.0011	0.00	0.0005	0.00	0.0006	0.00	0.0007	0.00	0.0001	0.20
<i>SF</i>	-0.0039	0.00	-0.0035	0.00	-0.0036	0.00	-0.0032	0.00	-0.0026	0.00	-0.0025	0.00
<i>DF</i>	0.0890	0.00	0.0809	0.00	0.0913	0.00	0.0749	0.00	0.0525	0.00	0.0658	0.00
Observations/R ²	21,671	0.56	26,855	0.57	34,491	0.56	21,671	0.55	26,855	0.57	34,491	0.56
Breusch-Pagan test	-	-	-	-	-	-	8,253.70	0.00	10,202	0.00	14,135	0.00
FOOD & BEVERAGES (4 industry dummies, 9 region dummies)												
<i>LKE</i>	0.0198	0.00	0.0319	0.00	0.0305	0.00	0.0150	0.00	0.0340	0.00	0.0325	0.00
<i>LO</i>	0.1354	0.00	0.1378	0.00	0.1382	0.00	0.1323	0.00	0.1345	0.00	0.1338	0.00
<i>SH</i>	0.0099	0.00	0.0072	0.00	0.0078	0.00	0.0041	0.00	0.0047	0.00	0.0058	0.00
<i>S3</i>	0.0069	0.00	0.0090	0.00	0.0088	0.00	0.0048	0.00	0.0084	0.00	0.0079	0.00
<i>S2</i>	0.0011	0.00	0.0016	0.00	0.0014	0.00	0.0003	0.45	0.0011	0.00	0.0008	0.01
<i>SF</i>	-0.0025	0.00	-0.0030	0.00	-0.0029	0.00	-0.0031	0.00	-0.0034	0.00	-0.0030	0.00
<i>DF</i>	0.1069	0.00	0.1154	0.00	0.1176	0.00	0.1104	0.00	0.1241	0.01	0.1075	0.00
Observations/R ²	3,832	0.61	4,788	0.61	6,007	0.61	3,832	0.59	4,788	0.61	6,007	0.00
Breusch-Pagan test	-	-	-	-	-	-	1,796.30	0.00	2,229.23	0.00	3,081.40	0.00
TEXTILES (2 industry dummies, 9 region dummies)												
<i>LKE</i>	0.0350	0.01	0.0380	0.00	0.0353	0.00	0.0028	0.90	0.0274	0.11	0.0262	0.06
<i>LO</i>	0.0904	0.00	0.1010	0.00	0.1112	0.00	0.0988	0.00	0.1196	0.00	0.1341	0.00
<i>SH</i>	0.0089	0.00	0.0131	0.00	0.0134	0.00	0.0040	0.03	0.0129	0.00	0.0131	0.00
<i>S3</i>	0.0053	0.00	0.0062	0.00	0.0045	0.00	0.0041	0.04	0.0071	0.00	0.0039	0.04
<i>S2</i>	0.0015	0.01	0.0015	0.00	0.0005	0.42	0.0012	0.08	0.0011	0.04	0.0002	0.74
<i>SF</i>	0.0009	0.18	0.0010	0.10	0.0011	0.04	-0.0008	0.43	0.0004	0.61	0.0000	0.99
<i>DF</i>	0.1084	0.00	0.1155	0.00	0.1196	0.00	0.0269	0.67	0.0804	0.07	0.0627	0.25
Observations/R ²	624	0.47	735	0.56	950	0.53	624	0.43	735	0.55	950	0.52
Breusch-Pagan test	-	-	-	-	-	-	210.31	0.00	332.09	0.00	361.16	0.00

Appendix Table 6 (continued)

Industry, independent variable, indicator	Pooled OLS						Random Effects					
	Lagged		Contemporaneous				Lagged		Contemporaneous			
	2001-2004		2001-2004		2000-2004		2001-2004		2001-2004		2000-2004	
	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value
APPAREL (no industry dummies, 9 region dummies)												
<i>LKE</i>	0.0141	0.10	0.0290	0.00	0.0328	0.00	0.0092	0.32	0.0388	0.00	0.0383	0.00
<i>LO</i>	0.1010	0.00	0.1404	0.00	0.1408	0.00	0.0984	0.00	0.1541	0.00	0.1521	0.00
<i>SH</i>	0.0104	0.00	-0.0062	0.00	-0.0035	0.08	0.0048	0.02	-0.0032	0.17	-0.0004	0.85
<i>S3</i>	0.0097	0.00	0.0051	0.03	0.0028	0.15	0.0032	0.23	0.0038	0.13	0.0004	0.85
<i>S2</i>	-0.0006	0.30	0.0003	0.60	-0.0007	0.20	-0.0002	0.79	-0.0001	0.86	-0.0011	0.06
<i>SF</i>	-0.0019	0.01	-0.0012	0.11	-0.0005	0.43	-0.0025	0.01	-0.0003	0.81	0.0001	0.96
<i>DF</i>	0.0764	0.01	0.0433	0.15	0.0499	0.04	0.0922	0.03	0.0551	0.26	0.1138	0.01
Observations/R ²	827	0.41	1,110	0.44	1,471	0.41	827	0.40	1,110	0.43	1,471	0.40
Breusch-Pagan test	-	-	-	-	-	-	157.27	0.00	224.05	0.00	369.58	0.00
WOOD PRODUCTS (no industry dummies, 9 region dummies)												
<i>LKE</i>	0.0340	0.00	0.0334	0.00	0.0350	0.00	0.0387	0.00	0.0416	0.00	0.0398	0.00
<i>LO</i>	0.0991	0.00	0.1102	0.00	0.1143	0.00	0.0793	0.00	0.1056	0.00	0.1096	0.00
<i>SH</i>	0.0109	0.00	0.0118	0.00	0.0127	0.00	0.0063	0.00	0.0064	0.09	0.0085	0.00
<i>S3</i>	0.0037	0.01	0.0045	0.00	0.0040	0.00	-0.0003	0.83	0.0073	0.00	0.0048	0.00
<i>S2</i>	0.0008	0.10	0.0013	0.00	0.0008	0.04	0.0005	0.39	0.0018	0.00	0.0008	0.07
<i>SF</i>	-0.0054	0.00	-0.0054	0.00	-0.0057	0.00	-0.0029	0.00	-0.0036	0.00	-0.0036	0.00
<i>DF</i>	0.0040	0.87	-0.0084	0.71	0.0047	0.82	0.0203	0.58	-0.0170	0.66	0.0047	0.89
Observations/R ²	2,173	0.43	2,508	0.45	3,286	0.45	2,173	0.41	2,508	0.43	3,286	0.44
Breusch-Pagan test	-	-	-	-	-	-	781.71	0.00	975.88	0.00	1,380.73	0.00
PAPER PRODUCTS (no industry dummies, 9 region dummies)												
<i>LKE</i>	0.0286	0.02	0.0444	0.00	0.0440	0.00	0.0307	0.00	0.0378	0.07	0.0410	0.02
<i>LO</i>	0.0769	0.00	0.0965	0.00	0.1072	0.00	0.0875	0.00	0.1197	0.00	0.1352	0.00
<i>SH</i>	0.0061	0.00	0.0065	0.00	0.0086	0.00	0.0023	0.06	0.0056	0.00	0.0087	0.00
<i>S3</i>	0.0038	0.00	0.0050	0.00	0.0033	0.01	0.0023	0.06	0.0051	0.00	0.0025	0.04
<i>S2</i>	0.0025	0.00	0.0021	0.00	0.0011	0.02	0.0011	0.06	0.0014	0.02	0.0004	0.49
<i>SF</i>	-0.0002	0.84	0.0008	0.36	0.0003	0.69	-0.0001	0.95	0.0007	0.54	0.0009	0.40
<i>DF</i>	0.0805	0.02	0.0661	0.03	0.0710	0.01	0.0715	0.15	0.0496	0.37	0.0206	0.68
Observations/R ²	758	0.57	927	0.47	1,195	0.47	758	0.44	927	0.46	1,195	0.46
Breusch-Pagan test	-	-	-	-	-	-	262.47	0.00	316.46	0.00	405.00	0.00

Appendix Table 6 (continued)

Industry, independent variable, indicator	Pooled OLS						Random Effects					
	Lagged		Contemporaneous				Lagged		Contemporaneous			
	2001-2004		2001-2004		2000-2004		2001-2004		2001-2004		2000-2004	
	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value
CHEMICALS (1 industry dummy, 9 region dummies)												
<i>LKE</i>	0.0217	0.02	0.0183	0.05	0.0223	0.01	0.0090	0.38	0.0297	0.00	0.0219	0.03
<i>LO</i>	0.1635	0.00	0.1649	0.00	0.1627	0.00	0.1039	0.00	0.1317	0.00	0.1656	0.00
<i>SH</i>	0.0058	0.00	0.0086	0.00	0.0088	0.00	0.0007	0.54	0.0073	0.00	0.0079	0.00
<i>S3</i>	0.0044	0.00	0.0047	0.00	0.0042	0.00	0.0041	0.00	0.0043	0.00	0.0047	0.00
<i>S2</i>	0.0009	0.07	0.0007	0.11	0.0004	0.30	0.0016	0.02	0.0006	0.32	0.0000	0.98
<i>SF</i>	-0.0049	0.00	-0.0037	0.00	-0.0034	0.00	-0.0038	0.00	-0.0029	0.01	-0.0028	0.00
<i>DF</i>	0.0950	0.00	0.0858	0.00	0.0958	0.00	0.0679	0.05	0.0858	0.01	0.0906	0.00
Observations/R ²	1,268	0.42	1,524	0.49	1,932	0.51	1,268	0.39	1,524	0.49	1,932	0.51
Breusch-Pagan test	-	-	-	-	-	-	357.02	0.00	482.24	0.00	658.86	0.00
RUBBER PRODUCTS (no industry dummies, 9 region dummies)												
<i>LKE</i>	0.0021	0.64	0.0055	0.23	0.0059	0.11	0.0030	0.52	0.0077	0.13	0.0096	0.04
<i>LO</i>	0.0870	0.00	0.0964	0.00	0.1017	0.00	0.0897	0.00	0.1196	0.00	0.1212	0.00
<i>SH</i>	0.0091	0.00	0.0122	0.00	0.0138	0.00	0.0055	0.01	0.0124	0.00	0.0131	0.00
<i>S3</i>	0.0071	0.00	0.0063	0.00	0.0045	0.00	0.0035	0.01	0.0055	0.00	0.0021	0.14
<i>S2</i>	0.0010	0.03	0.0010	0.02	0.0001	0.74	0.0008	0.09	0.0008	0.09	0.0002	0.70
<i>SF</i>	-0.0060	0.00	-0.0049	0.00	-0.0053	0.00	-0.0041	0.00	-0.0023	0.00	-0.0027	0.00
<i>DF</i>	0.2259	0.00	0.2076	0.00	0.2195	0.00	0.1470	0.00	0.1121	0.00	0.1215	0.00
Observations/R ²	973	0.46	1,160	0.47	1,545	0.44	973	0.43	1,160	0.44	1,545	0.42
Breusch-Pagan test	-	-	-	-	-	-	353.27	0.00	530.17	0.00	735.86	0.00
PLASTICS (no industry dummies, 9 region dummies)												
<i>LKE</i>	0.0191	0.05	0.0313	0.00	0.0349	0.00	0.0106	0.18	0.0304	0.00	0.0362	0.00
<i>LO</i>	0.1062	0.00	0.1099	0.00	0.1106	0.00	0.0968	0.00	0.1106	0.00	0.1129	0.00
<i>SH</i>	0.0100	0.00	0.0115	0.00	0.0130	0.00	0.0059	0.00	0.0097	0.00	0.0123	0.00
<i>S3</i>	0.0058	0.00	0.0053	0.00	0.0043	0.00	0.0044	0.00	0.0053	0.00	0.0039	0.00
<i>S2</i>	0.0005	0.16	0.0005	0.08	-0.0003	0.34	0.0005	0.14	0.0001	0.89	-0.0005	0.12
<i>SF</i>	-0.0035	0.00	-0.0029	0.00	-0.0029	0.00	-0.0035	0.00	-0.0024	0.00	-0.0018	0.00
<i>DF</i>	0.0798	0.00	0.0749	0.00	0.0906	0.00	0.0579	0.02	0.0266	0.28	0.0409	0.09
Observations/R ²	1,842	0.49	2,375	0.50	3,090	0.49	1,842	0.48	2,375	0.50	3,090	0.49
Breusch-Pagan test	-	-	-	-	-	-	441.84	0.00	621.59	0.00	842.48	0.00

Appendix Table 6 (continued)

Industry, independent variable, indicator	Pooled OLS						Random Effects					
	Lagged		Contemporaneous				Lagged		Contemporaneous			
	2001-2004		2001-2004		2000-2004		2001-2004		2001-2004		2000-2004	
	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value
NON-METALLIC MINERAL PRODUCTS (1 industry dummy, 9 region dummies)												
<i>LKE</i>	0.0425	0.00	0.0518	0.00	0.0550	0.00	0.0324	0.00	0.0799	0.00	0.0697	0.00
<i>LO</i>	0.1420	0.00	0.1457	0.00	0.1429	0.00	0.1530	0.00	0.1337	0.00	0.1369	0.00
<i>SH</i>	0.0035	0.00	0.0049	0.00	0.0052	0.00	0.0030	0.00	0.0051	0.00	0.0063	0.00
<i>S3</i>	0.0093	0.00	0.0090	0.00	0.0082	0.00	0.0059	0.00	0.0081	0.00	0.0061	0.00
<i>S2</i>	0.0007	0.22	0.0005	0.29	0.0006	0.23	0.0000	0.95	0.0007	0.16	0.0005	0.26
<i>SF</i>	-0.0041	0.00	-0.0031	0.00	-0.0029	0.00	-0.0031	0.00	-0.0008	0.35	-0.0007	0.41
<i>DF</i>	0.1077	0.00	0.0728	0.03	0.0845	0.01	0.0865	0.02	0.0142	0.71	0.0317	0.43
Observations/R ²	1,420	0.64	1,681	0.66	2,144	0.65	1,420	0.63	1,681	0.65	2,144	0.64
Breusch-Pagan test	-	-	-	-	-	-	730.87	0.00	862.07	0.00	1,227.31	0.00
BASIC METALS (2 industry dummies, 9 region dummies)												
<i>LKE</i>	0.0224	0.01	0.0226	0.00	0.0240	0.00	0.0391	0.00	0.0324	0.00	0.0424	0.00
<i>LO</i>	0.1036	0.00	0.1166	0.00	0.1138	0.00	0.0867	0.00	0.1290	0.00	0.1190	0.00
<i>SH</i>	0.0035	0.00	0.0060	0.00	0.0066	0.00	0.0013	0.19	0.0050	0.00	0.0058	0.00
<i>S3</i>	0.0077	0.00	0.0069	0.00	0.0066	0.00	0.0043	0.00	0.0054	0.00	0.0051	0.00
<i>S2</i>	0.0021	0.00	0.0009	0.06	0.0010	0.02	0.0008	0.06	-0.0005	0.40	-0.0002	0.60
<i>SF</i>	-0.0025	0.01	-0.0018	0.05	-0.0019	0.01	-0.0010	0.47	-0.0001	0.97	0.0004	0.75
<i>DF</i>	0.1023	0.00	0.1153	0.00	0.1124	0.00	0.0436	0.28	0.0477	0.19	0.0462	0.19
Observations/R ²	833	0.45	1,080	0.47	1,368	0.47	833	0.42	1,080	0.45	1,368	0.44
Breusch-Pagan test	-	-	-	-	-	-	327.12	0.00	452.76	0.00	666.47	0.00
METAL PRODUCTS (1 industry dummy, 9 region dummies)												
<i>LKE</i>	0.0439	0.00	0.0381	0.00	0.0398	0.00	0.0321	0.01	0.0358	0.00	0.0380	0.00
<i>LO</i>	0.1140	0.00	0.1412	0.00	0.1433	0.00	0.1106	0.00	0.1468	0.00	0.1465	0.00
<i>SH</i>	0.0049	0.00	0.0050	0.00	0.0066	0.00	0.0028	0.00	0.0043	0.00	0.0063	0.00
<i>S3</i>	0.0078	0.00	0.0085	0.00	0.0066	0.00	0.0038	0.00	0.0062	0.00	0.0042	0.00
<i>S2</i>	0.0013	0.00	0.0015	0.00	0.0006	0.00	0.0009	0.01	0.0009	0.01	0.0003	0.44
<i>SF</i>	-0.0036	0.00	-0.0025	0.00	-0.0032	0.00	-0.0016	0.05	-0.0012	0.11	-0.0018	0.01
<i>DF</i>	0.0408	0.06	0.0316	0.12	0.0692	0.00	0.0597	0.06	0.0336	0.33	0.0743	0.03
Observations/R ²	1,849	0.51	2,591	0.53	3,232	0.51	1,849	0.49	2,591	0.52	3,232	0.50
Breusch-Pagan test	-	-	-	-	-	-	650.49	0.00	891.43	0.00	1,132.26	0.00

Appendix Table 6 (continued)

Industry, independent variable, indicator	Pooled OLS						Random Effects					
	Lagged		Contemporaneous				Lagged		Contemporaneous			
	2001-2004		2001-2004		2000-2004		2001-2004		2001-2004		2000-2004	
	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value
GENERAL MACHINERY (2 industry dummies, 9 region dummies)												
<i>LKE</i>	0.0467	0.00	0.0480	0.00	0.0517	0.00	0.0250	0.03	0.0445	0.00	0.0503	0.00
<i>LO</i>	0.1000	0.00	0.1217	0.00	0.1244	0.00	0.0893	0.00	0.1285	0.00	0.1316	0.00
<i>SH</i>	0.0041	0.00	0.0031	0.04	0.0035	0.00	0.0028	0.01	0.0044	0.00	0.0034	0.01
<i>S3</i>	0.0061	0.00	0.0077	0.00	0.0071	0.00	0.0048	0.00	0.0051	0.00	0.0049	0.00
<i>S2</i>	0.0021	0.00	0.0026	0.00	0.0018	0.00	0.0013	0.03	0.0014	0.01	0.0011	0.03
<i>SF</i>	-0.0052	0.00	-0.0044	0.00	-0.0052	0.00	-0.0026	0.02	-0.0028	0.01	-0.0028	0.01
<i>DF</i>	0.0911	0.02	0.0762	0.02	0.0755	0.01	0.1141	0.03	0.1282	0.01	0.1365	0.00
Observations/R ²	1,061	0.45	1,449	0.46	1,818	0.46	1,061	0.44	1,449	0.45	1,818	0.45
Breusch-Pagan test	-	-	-	-	-	-	491.55	0.00	555.95	0.00	750.83	0.00
OFFICE, COMPUTING & PRECISION MACHINERY (1 industry dummy, 8 region dummies)												
<i>LKE</i>	0.0215	0.32	0.0578	0.01	0.0696	0.00	0.0153	0.49	0.1146	0.00	0.1122	0.00
<i>LO</i>	0.0799	0.00	0.0807	0.00	0.0800	0.00	0.0820	0.00	0.0744	0.00	0.0856	0.00
<i>SH</i>	0.0078	0.00	0.0070	0.00	0.0055	0.00	0.0032	0.07	0.0031	0.15	0.0018	0.42
<i>S3</i>	0.0074	0.00	0.0088	0.00	0.0096	0.00	0.0090	0.00	0.0101	0.00	0.0096	0.00
<i>S2</i>	0.0011	0.17	0.0011	0.16	0.0016	0.01	0.0006	0.25	0.0002	0.80	0.0008	0.20
<i>SF</i>	-0.0018	0.08	-0.0014	0.17	-0.0018	0.03	-0.0012	0.32	-0.0004	0.81	-0.0013	0.31
<i>DF</i>	-0.0140	0.78	-0.0503	0.29	-0.0273	0.51	0.0047	0.92	-0.0234	0.71	-0.0379	0.45
Observations/R ²	322	0.48	376	0.53	492	0.52	322	0.45	376	0.50	492	0.49
Breusch-Pagan test	-	-	-	-	-	-	64.66	0.00	102.07	0.00	147.83	0.00
ELECTRICAL MACHINERY (5 industry dummies; 9 region dummies)												
<i>LKE</i>	0.0132	0.17	0.0189	0.01	0.0175	0.01	0.0175	0.12	0.0260	0.02	0.0206	0.02
<i>LO</i>	0.1047	0.00	0.1019	0.00	0.1048	0.00	0.1062	0.00	0.0906	0.00	0.1026	0.00
<i>SH</i>	0.0067	0.00	0.0080	0.00	0.0112	0.00	0.0038	0.00	0.0074	0.00	0.0099	0.00
<i>S3</i>	0.0040	0.00	0.0042	0.00	0.0014	0.13	0.0022	0.11	0.0051	0.00	0.0020	0.08
<i>S2</i>	0.0005	0.29	0.0006	0.14	0.0001	0.89	0.0001	0.85	0.0004	0.48	-0.0007	0.12
<i>SF</i>	-0.0052	0.00	-0.0048	0.00	-0.0047	0.00	-0.0048	0.00	-0.0046	0.00	-0.0043	0.00
<i>DF</i>	0.1020	0.00	0.0903	0.00	0.1126	0.00	0.0604	0.03	0.0789	0.02	0.0862	0.00
Observations/R ²	928	0.57	1,112	0.59	1,458	0.59	928	0.55	1,112	0.59	1,458	0.59
Breusch-Pagan test	-	-	-	-	-	-	296.28	0.00	424.48	0.00	648.91	0.00

Appendix Table 6 (continued)

Industry, independent variable, indicator	Pooled OLS						Random Effects					
	Lagged		Contemporaneous				Lagged		Contemporaneous			
	2001-2004		2001-2004		2000-2004		2001-2004		2001-2004		2000-2004	
	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value
RADIO, TV & COMMUNICATION MACHINERY (1 industry dummy, 9 region dummies)												
<i>LKE</i>	0.0394	0.00	0.0328	0.00	0.0418	0.00	0.0366	0.01	0.0351	0.00	0.0472	0.00
<i>LO</i>	0.0810	0.00	0.0825	0.00	0.0865	0.00	0.0820	0.00	0.0850	0.00	0.0905	0.00
<i>SH</i>	0.0074	0.00	0.0064	0.00	0.0072	0.00	0.0053	0.00	0.0063	0.00	0.0065	0.00
<i>S3</i>	0.0064	0.00	0.0082	0.00	0.0067	0.00	0.0051	0.00	0.0069	0.00	0.0060	0.00
<i>S2</i>	-0.0004	0.39	-0.0006	0.18	-0.0002	0.53	0.0003	0.56	-0.0002	0.79	0.0003	0.60
<i>SF</i>	-0.0031	0.00	-0.0032	0.00	-0.0034	0.00	-0.0036	0.00	-0.0032	0.00	-0.0029	0.00
<i>DF</i>	0.0754	0.00	0.0633	0.00	0.0460	0.01	0.0719	0.01	0.0435	0.09	0.0284	0.27
Observations/R ²	962	0.57	1,174	0.58	1,594	0.57	962	0.56	1,174	0.58	1,594	0.57
Breusch-Pagan test	-	-	-	-	-	-	246.17	0.00	335.93	0.00	439.06	0.00
MOTOR VEHICLES (no industry dummies, 9 region dummies)												
<i>LKE</i>	-0.0032	0.83	0.0144	0.14	0.0171	0.06	-0.0194	0.62	0.0154	0.28	0.0250	0.05
<i>LO</i>	0.0968	0.00	0.0902	0.00	0.0925	0.00	0.0911	0.00	0.0943	0.00	0.0916	0.00
<i>SH</i>	0.0089	0.00	0.0118	0.00	0.0127	0.00	0.0058	0.01	0.0104	0.00	0.0108	0.00
<i>S3</i>	0.0053	0.03	0.0029	0.09	0.0018	0.28	0.0042	0.06	0.0028	0.17	0.0010	0.64
<i>S2</i>	-0.0016	0.07	0.0001	0.92	-0.0009	0.17	-0.0007	0.34	0.0009	0.18	-0.0001	0.92
<i>SF</i>	-0.0037	0.00	-0.0030	0.00	-0.0035	0.00	-0.0032	0.01	-0.0021	0.06	-0.0025	0.03
<i>DF</i>	0.1091	0.04	0.1361	0.01	0.1617	0.00	0.1267	0.05	0.1270	0.06	0.1605	0.01
Observations/R ²	472	0.42	590	0.45	742	0.43	472	0.40	590	0.44	742	0.42
Breusch-Pagan test	-	-	-	-	-	-	112.50	0.00	178.89	0.00	212.89	0.00
FURNITURE (no industry dummies, 9 region dummies)												
<i>LKE</i>	0.0040	0.69	0.0294	0.00	0.0278	0.00	0.0062	0.00	0.0346	0.00	0.0359	0.00
<i>LO</i>	0.0983	0.00	0.1092	0.00	0.1172	0.00	0.0876	0.00	0.1247	0.00	0.1339	0.00
<i>SH</i>	0.0097	0.00	0.0119	0.00	0.0153	0.00	0.0033	0.00	0.0118	0.00	0.0149	0.00
<i>S3</i>	0.0047	0.00	0.0057	0.00	0.0024	0.08	0.0041	0.00	0.0048	0.01	0.0012	0.48
<i>S2</i>	0.0009	0.14	0.0002	0.76	-0.0009	0.05	0.0010	0.00	0.0000	0.95	-0.0007	0.11
<i>SF</i>	-0.0027	0.00	-0.0024	0.00	-0.0038	0.00	-0.0029	0.00	-0.0016	0.04	-0.0034	0.00
<i>DF</i>	0.0993	0.00	0.1057	0.00	0.1090	0.00	0.1103	0.00	0.0690	0.03	0.0702	0.03
Observations/R ²	1,210	0.31	1,675	0.37	2,167	0.37	1,210	0.30	1,675	0.38	2,167	0.37
Breusch-Pagan test	-	-	-	-	-	-	198.44	0.00	341.38	0.00	520.06	0.00

Notes: robust standard errors (clustered by plant for random effects) are used to account for potential heteroscedasticity; coefficients from estimates of equation (1) that also include year, industry, and region dummies (see text for definitions); full estimation results available from the author.